

Civil Action
No. 3:01-CV-071
(Judge Varlan/Magistrate Judge Guyton)

UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TENNESSEE
AT KNOXVILLE

NATIONAL PARKS CONSERVATION ASSOCIATION, INC., SIERRA
CLUB, INC., and OUR CHILDREN'S EARTH FOUNDATION

Plaintiffs

v.

TENNESSEE VALLEY AUTHORITY

Defendant

**TENNESSEE VALLEY AUTHORITY'S BRIEF IN SUPPORT OF MOTION *IN LIMINE*
TO EXCLUDE THE OPINION TESTIMONY OF ROBERT H. KOPPE**

April 11, 2008

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STATEMENT

TVA has moved to exclude the testimony of Plaintiffs' proffered expert, Robert Koppe. As part of Plaintiffs' burden in this case, Plaintiffs must demonstrate that, in accordance with Tennessee regulations, emissions of certain regulated pollutants increased as a result of the alleged modification of the Bull Run plant in 1988. Although Plaintiffs seek to use Mr. Koppe as an expert on the subject of emissions increases, Mr. Koppe is not qualified to give such testimony, and his opinions neither fit this case nor are reliable under accepted standards. Before turning to these arguments, however, we summarize below the facts pertinent to this motion.

I. The 1988 Repair Projects at Issue in this Lawsuit

TVA's Bull Run "plant generates electricity by burning coal to create steam and then passing that steam through a turbine to drive a generator that ultimately produces electricity." (Am. Compl. ¶ 15 (Ct. Doc. 80).) The plant's boiler consists primarily of metal pipes or tubes that are used to progressively heat water into superheated steam, and Bull Run contains about 300 miles of such tubing in its furnace, economizer, superheater, and reheater sections. (Ex. 9, Koppe Deposition Transcript (hereafter, "Koppe Dep.") at 31.)¹ The portion of the tubing called the economizer is near the front-end of this heating process – as Mr. Koppe explains, "[f]eedwater first passes through the economizer," where "[c]ombustion gases that have already passed through much of the boiler and are relatively cool pass over the outsides of the economizer tubes." (Ex. 11, Dec. 28, 2007 Koppe Report (hereafter, "Koppe Rpt.") at 11; see also Koppe Dep. 41-43.) The superheater, by contrast, is at the back-end of the heating process – it is "the last section of tubes that the steam passes through before leaving the boiler and going to

¹ All of the exhibits cited in this brief are included in the compendium of "Materials Filed In Support of TVA's Motion for Summary Judgment" (Ct. Doc. 129).

the main turbine,” and its function is to “super heat[] the steam.” (Koppe Rpt. 43; Koppe Dep. 85-86.)

In the 1980s it was common for power plants to shut down every year or two for planned outages, and, according to Mr. Koppe, at TVA’s Bull Run plant in particular it was common for TVA to regularly overhaul the boiler each 18 months. (Koppe Dep. 101-02.) In 1988, TVA performed a number of repair projects during a planned outage. Two of those repair projects are at issue in this lawsuit – the replacement of the economizer and the replacement of part of the secondary superheater. (Koppe Rpt. 2; Am. Compl. ¶ 19 (Ct. Doc. 80).) In this lawsuit, Plaintiffs allege that by performing this 1988 repair work TVA “made physical changes to Bull Run that constitute ‘modifications,’” triggering the applicability of Tennessee’s Prevention of Significant Deterioration (PSD) requirements for nitrogen oxide (NO_x) and sulfur dioxide (SO₂). (See Am. Compl. ¶ 45 (Ct. Doc. 80).)

II. The Requirement for Plaintiffs To Prove an Emissions Increase

As the Sixth Circuit made clear, if Plaintiffs fail to prove that the 1988 work at Bull Run qualified as a PSD-triggering modification, they have no claim. *See Nat’l Parks Conservation Ass’n v. TVA*, 480 F.3d 410, 419 n.6 (6th Cir. 2007). As a *sine qua non* for establishing that TVA triggered PSD requirements, Plaintiffs must carry their burden to prove an emissions increase.² That is, Plaintiffs must prove that TVA made a “[m]ajor modification” of Bull Run by making a “physical change in . . . [the plant] that would result in a significant net emissions increase.” Tennessee Air Pollution Control Regulation (TAPCR) 1200-3-9-.01(4)(b)2 (1981)

² There are other issues about the triggering of PSD applicability. For example, routine maintenance, repair, and replacement activity does not trigger PSD applicability, even if there is an emissions increase. This motion concerns only Plaintiffs’ emissions increase evidence.

(Ex. A at A-4).³ One part of this required emission calculation requires determining whether “[a]ny increase in actual emissions [of NO_x or SO₂] from a particular physical change” is “[s]ignificant” in that it is greater than 40 tons per year. TAPCR 1200-3-9-.01(4)(b)4(i)(I) & 1200-3-9-.01(4)(b)24(i)(II)-(III) (Ex. A at A-5 & A-9).

The *only* evidence Plaintiffs proffer to show an emissions increase is Mr. Koppe’s testimony. (Ex. 24, Plaintiffs’ Objections and Responses to Defendant Tennessee Valley Authority’s Second Set of Interrogatories, No. 16.) Mr. Koppe performed three different kinds of emissions increase calculations, all three of which are subject to this motion. Thus, this motion seeks to exclude all of Plaintiffs’ evidence pertaining to the emissions increase issue.⁴

III. Mr. Koppe’s Proffered Opinion Testimony about Alleged Emissions Increases at the Bull Run Plant

A. Calculation # 1: Actual-to-Potential

To determine pre-project baseline *actual* emissions, Mr. Koppe calculated Bull Run’s average annual emissions of SO₂ and NO_x during the two years immediately preceding the 1988 outage (March 1986 through February 1988). According to Mr. Koppe, these were 33,392 tons per year of SO₂ and 13,563 tons per year of NO_x. (Koppe Rpt. 53-54.)

For the post-project period, Mr. Koppe determined Bull Run’s *potential* emissions of SO₂ and NO_x. “Potential to emit” is defined as “the maximum capacity of a stationary source to emit

³ The regulations in effect at the time of the 1988 Bull Run projects govern. (Am. Compl. ¶ 39 (Ct. Doc. 80).) TVA’s citations are to a compilation of superseded regulations certified by the Tennessee State Library and Archives, which reflects the regulations in effect in 1988. The relevant pages of those regulations are attached as Exhibit A to this Brief; the full set of 1988 Tennessee PSD regulations are Exhibit 1B in the compendium of “Materials Filed In Support of TVA’s Motion for Summary Judgment” (Ct. Doc. 129).

⁴ If Mr. Koppe’s testimony is excluded, Plaintiffs will be unable to prove an essential element of their case, namely, the PSD-triggering modification. Under such circumstances, the Court should then enter summary judgment against Plaintiffs.

a pollutant under its physical and operational design.” TAPCR 1200-3-9-.01(4)(b)5 (Ex. A at A-6). As Mr. Koppe explained, Bull Run’s “potential emissions are what Bull Run would emit if it ran at its maximum possible output, full power, 24 hours a day, seven days a week, 365 days in the year with no break,” something Mr. Koppe readily conceded does not “happen in the real world.” (Koppe Dep. 106; see also Koppe Rpt. 51.) Mr. Koppe calculated Bull Run’s post-project potential NO_x emissions at 19,664 tons per year. (Koppe Rpt. 53.) He calculated Bull Run’s post-project potential SO₂ emissions two different ways – either 140,459 tons per year (at the plant’s permit limits for SO₂ emissions) or 54,377 tons per year (at the highest sulfur content for the coal actually burned at Bull Run, which produced much lower SO₂ emissions than the plant’s permit allowed). (Koppe Rpt. 54.)

To calculate the “actual-to-potential” emissions increases, Mr. Koppe subtracted the baseline pre-project actual annual emissions from the post-project potential annual emissions⁵:

	NO _x	SO ₂ (Permit Limits)	SO ₂ (Highest Sulfur)
Post-Project Potential:	19,664	140,459	54,377
Pre-Project Actual:	<u>- 13,563</u>	<u>- 33,392</u>	<u>- 33,392</u>
Actual-to-Potential Increase:	6,101	107,067	20,985

B. Calculation # 2: Retrospective Emissions Projections

Mr. Koppe also performed retrospective emissions projections, calculating “[t]he increases from baseline emissions that would be expected solely as a result of decreases in the unplanned outage rate of the unit due to each of the projects separately.” (Koppe Rpt. 8.) That is, long after the completion of the 1988 projects, Mr. Koppe determined the post-project emissions levels he believes TVA should have projected before undertaking the 1988 projects.

⁵ On some of Mr. Koppe’s calculations, the annual emission numbers disclosed in his report yield increases one ton different from the amounts of emission increase he states. *Compare* chart with Koppe Rpt. 8. This is apparently due to his rounding.

He prepared these retrospective emission projections separately for the economizer and superheater projects in order to opine as to “the magnitude of any changes in the annual emissions from the unit that TVA should have expected as a result of that project.” (*Id.* at 2.)

Mr. Koppe’s methodology for preparing these retrospective “projections” of post-project emissions used a complicated formula that turned on identifying lost availability during the baseline period, expressed in terms of equivalent availability factor (EAF). As Mr. Koppe explained, “[c]onceptually EAF is intended to represent how much of the possible output of a unit the unit was actually capable of generating.” (Koppe Dep. 16.) Mr. Koppe then projected that such lost pre-project EAF was precisely equivalent to expected post-project EAF improvement, and calculated post-project emissions under the assumption that this projected increase in Bull Run’s availability would be translated directly into actual use of the unit.⁶ Importantly, the methodology he used to calculate expected availability improvement here is *different* from the methodology he has “found is universal in the utility industry.” (Koppe Rpt. 24.) He used this different methodology here because one of the Plaintiffs’ lawyers asked him to do so. (Koppe Dep. 121-22.)

Although his methodology may look complicated, Mr. Koppe admitted that in reality it amounts to no more than simply identifying plant outages caused by tube leaks in the economizer and superheater during the two years immediately preceding the 1988 projects, calculating the amount of emissions that would have occurred if the plant had been running during such downtime, and then treating these amounts of lost emissions as “projections” of increased future emissions. For example, for the economizer Mr. Koppe found two forced outages caused by economizer tube leaks, totaling 104 hours of plant downtime, during the two

⁶ See Ex. 17 (Koppe Dep. Ex. 26, summary of Mr. Koppe’s methodology); Koppe Dep. 122 (confirming correctness of the summary in Deposition Exhibit 26); Koppe Rpt. 51-54.

years from March 1986 through February 1988. (Koppe Dep. 124; Koppe Rpt. 48 (Table 2).) This represents an average of 52 hours per year. As he conceded at his deposition, “what [his methodology] boils down to is simply calculating the amount of emissions associated with the 52 hours per year of down time caused by the economizer and calling that the projected emission increase.” (Koppe Dep. 125.)⁷

Using this methodology, Mr. Koppe predicted that annual SO₂ emissions would increase to 33,779 tons per year as a result of the superheater project and to 33,666 tons per year as a result of the economizer project. (Koppe Rpt. 54.) Similarly, he predicted that annual NO_x emissions would increase to 13,720 tons per year as a result of the superheater project and to 13,675 tons per year as a result of the economizer project. (Koppe Rpt. 53.) For pre-project emissions, Mr. Koppe used the same pre-project baseline annual emissions of SO₂ (33,392 tons per year) and NO_x (13,563 tons per year) that he had used for his actual-to-potential calculations (Calculation # 1). In summary, his retrospective projections of emissions increases were:

	NO_x (Superheater)	NO_x (Economizer)	SO₂ (Superheater)	SO₂ (Economizer)
Post-Project Projected:	13,720	13,675	33,779	33,666
Pre-Project Actual:	<u>- 13,563</u>	<u>- 13,563</u>	<u>- 33,392</u>	<u>- 33,392</u>
Projected Increase:	157	112	387	274

C. Calculation # 3: Actual-to-Actual

Finally, Mr. Koppe performed actual-to-actual calculations. He again used the same pre-project baseline annual emissions of SO₂ and NO_x that he had used for his other calculations, covering the March 1986 through February 1988 period immediately preceding the March 1988

⁷ This is confirmed by the fact that Mr. Koppe’s projected emissions increases can be calculated just by multiplying the plant’s hourly emission rate by the downtime. For example, his projected SO₂ emission increase of 274 tons per year for the economizer project is obtained by multiplying the 5.26 tons per hour SO₂ emission rate he determined for Bull Run by the 52 hours per year of downtime he identified: $5.26 \times 52 = 273.52$. (Koppe Dep. 127.)

outage in which the projects were performed. He calculated the post-project actual emissions of SO₂ and NO_x for the two years immediately following the completion of the 1988 repair work – according to Mr. Koppe, 39,970 tons per year of SO₂ and 15,496 tons per year of NO_x. (Koppe Rpt. 53-54.) By subtraction, he calculated:

	NO _x	SO ₂
Post-Project Actual:	15,496	39,970
Pre-Project Actual:	<u>- 13,563</u>	<u>- 33,392</u>
Actual-to-Actual Increase:	1,933	6,578

ARGUMENT

Under Rule 702 of the Federal Rules of Evidence:

If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill experience, training, or education, may testify thereto in the form of an opinion or otherwise, if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case.

This rule codifies the Supreme Court’s trilogy of decisions addressing the admissibility of expert testimony in *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579 (1993), *Gen. Elec. Co. v. Joiner*, 522 U.S. 136 (1997), and *Kumho Tire Co. v. Carmichael*, 526 U.S. 137 (1999). For three separate and independent reasons, Plaintiffs cannot carry their burden to establish the admissibility of Mr. Koppe’s opinions.

First, a witness must be “qualified as an expert” to give expert opinions. Fed. R. Evid. 702. As explained in section I, Mr. Koppe does not have the right kind of qualifications to give the opinions on the emissions calculations and projections he disclosed here.

Second, expert testimony must be “relevant” by being “sufficiently tied to the facts of the case” to aid in deciding the case. *Daubert*, 509 U.S. at 589, 591. This is the concept of “fit.” *Id.* at 591. As explained in section II, Mr. Koppe’s emissions calculations are not the right kind of

emissions calculations under Tennessee's regulations. Thus, his emissions increase opinions do not fit this case and should be excluded on relevance grounds.

Third, expert opinion evidence must be "not only relevant, but reliable," *Daubert*, 509 U.S. at 589, "the product of reliable principles and methods." Fed. R. Evid. 702(2). As explained in section III, Mr. Koppe's retrospective projections of increased emissions (Calculation # 2) – made using an unpublished, untested methodology specified by Plaintiffs' lawyer rather than selected by Mr. Koppe using expertise of his own – are not reliable.

"As 'gatekeeper,' the trial judge is imbued with discretion in determining whether or not a proposed expert's testimony is admissible, based on whether it is both relevant and reliable." *Johnson v. Manitowoc Boom Trucks, Inc.*, 484 F.3d 426, 429 (6th Cir. 2007). Any decision to exclude proffered expert testimony is reviewed on appeal under an abuse of discretion standard, *Joiner*, 522 U.S. at 139, even if the exclusion of evidence leads to summary judgment against the party proffering the evidence, *Nelson v. Tenn. Gas Pipeline Co.*, 243 F.3d 244, 248 (6th Cir. 2001). Here, TVA respectfully submits that the appropriate exercise of the Court's discretion would be to exclude Mr. Koppe's opinion testimony regarding emissions increases altogether.

I. Plaintiffs Have Failed To Establish Mr. Koppe's Qualifications to Perform Emissions Projections and Calculations for a Coal-Fired Power Plant.

"A witness is not an expert simply because he claims to be." *Brown v. Raymond Corp.*, 318 F. Supp. 2d 591, 598 (W.D. Tenn. 2004), *aff'd*, 432 F.3d 640 (6th Cir. 2005). Instead, "a party proffering expert testimony must show by a 'preponderance of proof' that the expert whose testimony is being offered is qualified." *Pride v. BIC Corp.*, 218 F.3d 566, 578 (6th Cir. 2000) (*quoting Daubert*, 509 U.S. at 592 n.10). "To qualify as an expert under Rule 702, a witness must first establish his expertise by reference to 'knowledge, skill, experience, training, or education.'" *Id.* at 577 (*quoting* Fed. R. Evid. 702).

“When making a preliminary finding regarding an expert’s qualifications,” the key issue is “not the qualifications of a witness in the abstract, but whether those qualifications provide a foundation for a witness to answer a specific question.” *Smelser v. Norfolk S. Ry. Co.*, 105 F.3d 299, 303 (6th Cir. 1997) (quoting *Berry v. City of Detroit*, 25 F.3d 1342, 1351 (6th Cir. 1994)). That is, “[f]or a Court to recognize a witness as a qualifying expert, the subject matter of the testimony must lie within the purview of the [witness’s] expertise,” *Botnick v. Zimmer, Inc.*, 484 F. Supp. 2d 715, 719 (N.D. Ohio 2007) (excluding engineer whose field was different from the one at issue in the case), and accordingly “[t]he trial court must determine whether the expert’s training and qualifications relate to the subject matter of the proposed testimony.” *Smelser*, 105 F.3d at 303. For example, in *Coal Res. v. Gulf & W. Indus.*, 954 F.2d 1263 (6th Cir. 1992), the CEO of a coal company was qualified to give expert opinion testimony about development and mining of the property at issue in the case. *Id.* at 1268. However, he was not qualified to testify concerning the costs and appropriateness of building coal preparation plants on the site, and it was error to permit him to do so. *Id.* at 1268-69.

Here, Plaintiffs cannot carry their burden to establish Mr. Koppe’s expertise to make the emissions calculations he proffers. Although Mr. Koppe is an engineer, his qualifications, training and experience are not the right fit for the kind of testimony he proffers here.

To begin with, Mr. Koppe has no training in performing emissions calculations, as he forthrightly admitted at his deposition:

Q: [D]o you have any specific training for performing emissions calculations?

A: No.

(Koppe Dep. 8-9.) In fact, not only does Mr. Koppe have no training in performing emissions calculations, his formal education does not relate to coal-fired power plants at all. Instead, he

has an undergraduate degree in wood products engineering, and a graduate degree in nuclear engineering. (Koppe Rpt. 56.)

Similarly, Mr. Koppe has no experience – outside of lawsuits – in performing emissions calculations. (Koppe Dep. 8.) The first time he ever performed emissions calculations for a coal-fired power plant was in a lawsuit against TVA relating to TVA’s Colbert Plant in Alabama. (*Id.* at 7; Ex. 10, Colbert Koppe Dep. 8.) Before then he had never performed any fossil plant emissions calculations. (Koppe Dep. 7.) A second time he performed emissions calculations was in this lawsuit. (*Id.* at 8.) A third time Mr. Koppe *may* have performed emissions calculations (he could not be sure) was in some other lawsuit, but he cannot remember which one because he has served as a paid witness in lawsuits so many times that “[t]he cases blur together.” (*Id.* at 8, 144-45.) While Mr. Koppe has been employed in many cases in the New Source Review Enforcement Initiative EPA launched in 1999, it has not been as an emissions expert. Instead, his role is to project plant availability (information that other witnesses use as part of their emissions calculations) or to opine about routine maintenance, repair or replacement. (Ex. 10, Colbert Koppe Dep. 5-8.) Plaintiffs have identified no case in which Mr. Koppe has been found by a Court to be an expert in *emissions projections and calculations for coal-fired power plants*, and his experience performing such calculations as a paid witness in one or two other cases is no basis to find him qualified. *See Thomas J. Kline, Inc. v. Lorillard, Inc.*, 878 F.2d 791, 800 (4th Cir. 1989) (“[I]t would absurd to conclude that one can become an expert simply by accumulating experience in testifying.”).

Not only does Mr. Koppe have no training or experience in performing emissions calculations for coal-fired power plants, he has no real world experience determining PSD applicability at all. Specifically, he has never been involved in preparing or submitting a PSD

permit application. (Koppe Dep. 112.) More broadly, he has never been involved in *any* kind of permitting activities for a coal-fired power plant. (Ex. 10, Colbert Koppe Dep. 9.)

Indeed, Mr. Koppe does not pretend to have expertise in calculating or projecting emissions for determining PSD applicability. He identified his field of expertise as being “generally . . . in the design and operation of electric generating units.” (Koppe Dep. 5.) This “field,” of course, is so broad as to be no field at all. As the Sixth Circuit has explained about such broad claims of expertise:

[T]here is no such “field” as “police policies and practices.” . . . This term . . . is so broad as to be devoid of meaning. It is like declaring an attorney an expert in the “law.” A divorce lawyer is no more qualified to opine on patent law questions than anyone else, and it is a mistake for a trial judge to declare anyone to be generically an expert.

Berry, 25 F.3d at 1352. Mr. Koppe readily admitted that within the “field” of the design and operation of electric generating units, his “expertise is relatively broad and of course not extremely deep.” (Koppe Dep. 5.) Within the “broad” field, he identified his “deep” expertise as covering “power plant performance, power plant availability, capacity factor, [and] heat rate.” (*Id.*) He did not identify emissions projections and calculations for a coal-fired power plant as something in which he claims “deep” expertise.

Accordingly, Plaintiffs cannot satisfy their burden to establish that Mr. Koppe is qualified to render the kind of opinion for which he is proffered as an expert here – emissions projections and calculations for a coal-fired power plant.

II. Mr. Koppe’s Emissions Increase Calculations Are Not the Right Kind of Calculations Under Tennessee’s Regulations and Are Thus Irrelevant Because They Do Not Fit This Case.

Under Tennessee’s regulations applicable to the 1988 Bull Run projects, a PSD-triggering “[m]ajor modification” means, “subject to certain excluded activities such as routine maintenance, repair, and replacement, “any physical change in or change in the method of

operation of a major stationary source that would result in a significant net emissions increase of any pollutant subject to regulation under this Division 1200-3.” TAPCR 1200-3-9-.01(4)(b)2 (Ex. A at A-4). A “[n]et emissions increase’ means . . . [a]ny increase in **actual emissions** from a particular physical change or change in the method of operation at a stationary source.” TAPCR 1200-3-9-.01(4)(b)4(i)(I) (Ex. A at A-5) (emphasis added). The term “actual emissions” is specifically defined in Tennessee’s regulations:

“Actual emissions” means the actual rate of emissions of a pollutant from an emissions unit, as determined in accordance with subparts (i)-(iii) below.

- (i) In general, actual emissions as of a particular date shall equal the average rate, in tons per year, at which the unit **actually emitted** the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. The Technical Secretary may allow the use of a different time period upon a determination that it is more representative of normal source operation. Actual emissions shall be calculated using the unit’s actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.
- (ii) The Technical Secretary may presume that source-specific **allowable emissions** for the unit are equivalent to the actual emissions of the unit.
- (iii) For any emissions unit which has not begun normal operations on the particular date, actual emissions shall equal the **potential to emit** of the unit on that date.

TAPCR 1200-3-9-.01(4)(b)22 (Ex. A at A-8 & A-9) (emphases added).

None of Mr. Koppe’s three calculations qualifies as a calculation of relevant “actual emissions” under Tennessee’s regulatory definition. Because he failed to conform his calculations to the regulatory definition of “actual emissions,” his calculations of purported significant net emissions increases do not fit this case and should be excluded as irrelevant.

A. Mr. Koppe's Calculation # 1 – Actual-To-Potential – Should be Excluded As Irrelevant.

Mr. Koppe stated that he calculated “[t]he increase from the baseline emissions to the potential future emissions, since it is my understanding that that was the calculation required by the regulations at the time of the Bull Run Projects at issue.” (Koppe Rpt. 8.) Mr. Koppe’s “understanding” that an actual-to-potential test is applicable was based on “what [he] was told by Mr. Hays,” Plaintiffs’ counsel in this case. (Koppe Dep. 104-05.)⁸

Mr. Koppe’s understanding that an actual-to-potential calculation was required by Tennessee’s regulations is incorrect. A unit’s potential emissions may be used in only one circumstance: If the unit “has not begun normal operations.” TAPCR 1200-3-9-.01(4)(b)22(iii) (Ex. A at A-9). Mr. Koppe acknowledged that by 1988 the Bull Run plant – which had by then been in operation for about 21 years – “had begun its normal operations as a coal-fired power plant.” (Koppe Dep. 29.) Because Bull Run was an existing unit which had begun normal operations, an actual-to-potential triggering test for determining PSD applicability is improper under Tennessee’s regulations.

This reading of Tennessee’s regulations is consistent with a United States Court of Appeals decision that was handed down about two years after the 1988 Bull Run projects, *Wisconsin Elec. Power Co. v. Reilly*, 893 F.2d 901 (7th Cir. 1990) (“*WEPCO*”), which rejected use of an actual-to-potential test for an existing unit. In that case, WEPCO proposed to undertake extensive renovations at its Port Washington power plant, and EPA’s position was that

⁸ Mr. Koppe added that his “reading of the regulations . . . confirmed” what Mr. Hays had told him. (Koppe Dep. 104.) He initially identified the regulations he had consulted as “the Alabama SIP [State Implementation Plan],” then corrected himself to say that it was the “Tennessee SIP.” (*Id.* at 105.) When presented with a copy of the relevant Tennessee regulations, however, Mr. Koppe could not identify the portion that “confirmed” the instructions of Plaintiffs’ counsel that he should use an actual-to-potential test. (*Id.* at 105-06.)

this work triggered the pollution reduction obligations of the PSD program. “To determine whether the project would result in [a PSD-triggering] emissions increase, the EPA compared *actual* pre-renovation emissions with *potential* post-renovation emissions at the Port Washington Plant.” 893 F.2d at 916 (emphases added). The PSD regulation applicable in *WEPCO* had – just like the Tennessee regulation – a provision stating that “[f]or any emissions unit which has not begun normal operations on the particular date, actual emissions shall equal the potential to emit of the unit on that date.” *Id.* (quoting 40 C.F.R. § 52.21(b)(21)(iv) (1988)). EPA’s theory was “that because the source had not yet begun operations following the renovation, actual emissions following the renovation were deemed to be the source’s potential to emit.” *Id.* (internal quotation marks and alterations omitted). Thus, “[i]n calculating the plant’s post-renovation potential to emit, the EPA base[d] its figures on round-the-clock operations (24 hours per day, 365 days per year) because *WEPCO could potentially* operate its facility continuously, despite the fact that *WEPCO ha[d]* never done so in the past.” *Id.* (emphasis in original). The Seventh Circuit understood the “circular” nature of EPA’s reasoning:

[I]n order to demonstrate that the Port Washington like-kind replacement project constitutes a modification, the EPA applies the potential to emit concept (to show an increase in emissions). And in order to apply the potential to emit concept to like-kind replacement, the EPA assumes that the plant is a “modified” unit.

Id. at 917. The Seventh Circuit then squarely rejected EPA’s position:

In sum, we certainly do not suggest that the EPA may never subject replaced units to the potential to emit concept under its regulations. The EPA may, if it wishes, undertake notice and comment procedures to apply the potential to emit concept to like-kind replacement. *See* 42 U.S.C. § 7607(d). But existing regulations do not seem to us to support such an application. We therefore believe that the EPA’s reliance on an assumed continuous operation as a basis for finding an emissions increase is not properly supported. The EPA’s determination that there has been a major modification for PSD purposes must be set aside.

Id. at 918.

It is wrong to use an actual-to-potential PSD triggering test here. Accordingly, Mr. Koppe's actual-to-potential calculations set forth information that is not relevant to any issue under the applicable law, and those calculations should be excluded as irrelevant.

B. Mr. Koppe's Calculation # 2 – Retrospective Emissions Projections – Should Be Excluded As Irrelevant.

Mr. Koppe's retrospective projections of emissions increases he contends TVA should have projected in 1988 do not fit within any of the Tennessee regulation's three definitions of "actual emissions." The post-project emissions increases he hypothesizes are projections, and do not even purport to qualify as anything that Bull Run "actually emitted." Thus, they do not fit within TAPCR 1200-3-9-.01(4)(b)22(i). Nor do they fit within subsection (ii), for his projected emissions increases are not calculations of "allowable emissions."⁹ And his projections are not calculations of potential emissions (subsection (iii)), an option which as just explained is off the table for this case in any event.

Thus, Mr. Koppe's emissions projections do not qualify as "actual emissions" under any of the three definitional options set forth in TAPCR 1200-3-9-.01(4)(b)22(i)-(iii). Because what Plaintiffs must prove is an increase in Bull Run's "actual emissions" (TAPCR 1200-3-9-.01(4)(b)4(i)(I)), and because Mr. Koppe's retrospective emissions increase projections are not calculations of "actual emissions," they are irrelevant and should be excluded for lack of fit.¹⁰

⁹ "Allowable" emissions are calculated using a source's permit limits and its maximum rated capacity. TAPCR 1200-3-9-.01(4)(b)17 (Ex. A at A-8). It is undisputed that the 1988 Bull Run projects did not increase the plant's allowable emissions. (Koppe Dep. 107.)

¹⁰ As explained in section III below, a separate and independent reason Mr. Koppe's emissions projections should be excluded is that he used an invalid and unreliable method.

C. Mr. Koppe's Calculation # 3 – Actual-To-Actual – Should Be Excluded As Irrelevant.

Mr. Koppe's third emissions increase calculation – actual-to-actual – is irrelevant as well, although it fits within the regulatory definition of “actual emissions,” because of mistakes Mr. Koppe made in *both numbers* used in the calculation. For the *post-project* SO₂ emissions, Mr. Koppe improperly included emissions increases attributable to increased sulfur content in the coal used. For the *pre-project* emissions, Mr. Koppe used the wrong baseline period in performing his calculations (a mistake, in fact, common to all his calculations). Because he used mistaken numbers in both the minuend and the subtrahend of the subtraction he performed, the resulting difference he calculated is meaningless for this lawsuit.

1. Mr. Koppe Improperly Included Increased Post-Project SO₂ Emissions Attributable To Burning Higher Sulfur Coal.

Under Tennessee's regulations, “[u]se of an alternative fuel or raw material by a stationary source” is specifically excluded from being a PSD triggering event “unless such change would be prohibited under a legally enforceable permit condition.” TAPCR 1200-3-9-.01(4)(b)2(i)(V) (Ex. A at A-5). Under Bull Run's permit, the plant was permitted to emit SO₂ at a rate up to 4.0 pounds per million British thermal units of coal burned. (Ex. 4A (Houston Report Ex. DH 7).) While the plant never came close to this limit, the actual sulfur content in the coal burned did vary because of the inherent variability of coal properties.

Mr. Koppe recognized that emissions changes resulting from differences in the fuel used should not be a basis for finding that PSD is triggered. Thus, in his retrospective projections of post-project emissions (Calculation # 2), he “assumed that the post-project sulfur content (and the BTU content) of the fuel would be the same as the pre-project values.” (Koppe Rpt. 6.) Mr. Koppe's actual-to-actual emissions increase opinion (Calculation # 3), however, fails to account for the need to hold constant coal properties such as sulfur content. The sulfur content

of the coal used at the Bull Run plant in the two years immediately following the completion of the 1988 projects was about 5% higher than the sulfur content of the coal used at the plant in the two years immediately preceding the 1988 outage, and this increased sulfur content was not related to the Spring 1988 projects. (Ex. 4, Houston Decl. ¶¶ 9-10.) Accordingly, Mr. Koppe's post-project "actual" emissions calculations include increased SO₂ emissions that were a result of nothing more than the Bull Run plant burning coal with a higher sulfur content than was used in the pre-project period. For that reason, his post-project "actual" SO₂ emission number is incorrect for use in calculating emissions increases allegedly caused by the 1988 projects.

2. Mr. Koppe Used the Wrong Baseline Period for Calculating Pre-Project Actual Emissions.

For his baseline period, Mr. Koppe used the two years immediately preceding the March 1988 outage because (1) Plaintiffs' counsel told him to do so and (2) he viewed Tennessee's regulations as requiring use of that baseline period. (Koppe Dep. 108.) Plaintiffs cannot satisfy their burden to establish that this baseline period is the correct one to use.

The relevant Tennessee regulation says: "***In general***, actual emissions as of a particular date shall equal the average rate, in tons per year, at which the unit actually emitted the pollutant during ***a*** two-year period which precedes the particular date ***and which is representative of normal source operation***." TAPCR 1200-3-9-.01(4)(b)22(i) (emphases added) (Ex. A at A-9). The regulation does not simply say to use "***the*** two-year period which precedes the particular date." Interpreting the regulation as always automatically requiring use of ***the*** two-year period preceding an event as the baseline period would render the additional requirement that the baseline period also be "representative of normal source operation" superfluous. Indeed, given that the regulation is prefaced by "In general," it obviously lays down no hard-and-fast rule that the baseline period must always be ***the*** two-year period preceding an event. This reading is

corroborated by the *WEPCO* case, where EPA and the Seventh Circuit dealt with a similar regulation. There, the baseline period was not the two years immediately preceding the applicability determination; instead, because steam drum cracks had led to source curtailment, data from earlier years was used as the PSD baseline. *WEPCO*, 893 F.2d at 916.

Thus, it is *not* the case that the two years immediately preceding the outage are automatically to be used as the baseline period, as Mr. Koppe improperly assumed here. Further, Plaintiffs cannot carry their burden to prove that those two years were the most representative of normal source operations at Bull Run. As TVA's Donald Houston explains:

In my analysis, I used the 24-month period having the highest annual emissions rate during the five years preceding the project as the baseline period representative of normal operations. I looked at this five-year period because it would normally encompass a turbine overhaul cycle, which is generally five years or longer, and any fluctuations in utilization of the unit that may be due to various factors, such as weather, short term equipment problems, coal variability, availability of other units on the system, etc. Also, since operational problems frequently result in less coal burned and lower emissions, the 24-month period with the highest emissions should be representative of the most normal 24-month period of operation during the five-year period before the project.

(Ex. 4, Houston Decl. ¶ 7(a)(i).) Using this approach, Mr. Houston's conclusion is that the September 1984 through August 1986 period, rather than the two years immediately preceding the project, is the appropriate baseline period. (*Id.* at ¶ 7(a)(ii).) Further, similar to *WEPCO* where steam drum cracks forced curtailment of the unit in the immediate pre-project period, here Bull Run was in a continuous derating¹¹ because of turbine problems right before the 1988 outage (i.e., during part of Mr. Koppe's baseline period). (Koppe Dep. 152-53.)

Accordingly, Plaintiffs have not carried their burden to prove that the pre-project baseline period selected by Mr. Koppe is the appropriate one. If it is not, then he has calculated emissions

¹¹ As Mr. Koppe explains: "Sometimes, a unit is available but has some equipment problem that limits its output to less than its capability – less than full power. If a unit is limited to less than its capability, it is said to be derated or in a derating." (Koppe Rpt. 15.)

during a time period that was not representative of normal source operations, and his calculations are thus irrelevant and should be excluded.

III. Mr. Koppe Did Not Use a Valid Methodology for His Retrospective Emissions Increase Projections (Calculation # 2).

In *Daubert*, the Supreme Court addressed “the admissibility of purportedly scientific evidence,” and assigned trial judges “a gatekeeping role” to “ensure that any and all scientific testimony or evidence admitted is not only relevant, but reliable.” 509 U.S. at 589, 597. “This entails a preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid,” *id.* at 592-93, for *Daubert* imposes “exacting standards of reliability.” *Nisus Corp. v. Perma-Chink Sys., Inc.*, 327 F. Supp. 2d 844, 854 (E.D. Tenn. 2003). *Daubert*’s general gatekeeping obligation “applies not only to testimony based on ‘scientific’ knowledge, but also to testimony based on ‘technical’ and ‘other specialized’ knowledge.” *Kumho*, 526 U.S. at 141.

The Sixth Circuit has recently summarized the relevant inquiry, as follows:

In *Daubert*, the Supreme Court provided a nonexhaustive list of factors which may, in any given case, bear on a trial judge’s gatekeeping determinations. These factors include: (1) whether a “theory or technique . . . can be (and has been) tested”; (2) whether the theory “has been subjected to peer review and publication”; (3) whether, with respect to a particular technique, there is a high “known or potential rate of error” and whether there are “standards controlling the technique’s operation”; and (4) whether the theory enjoys “general acceptance” within a “relevant scientific community.”

Johnson v. Manitowoc Boom Trucks, Inc., 484 F.3d 426, 429 (6th Cir. 2007) (quoting *Daubert*, 509 U.S. at 592-94); *see also Mike’s Train House, Inc. v. Lionel, LLC*, 472 F.3d 398, 407 (6th Cir. 2006). Additionally, the Sixth Circuit has identified another factor to consider, “The Prepared-Solely-for-Litigation Factor.” *Johnson*, 484 F.3d at 434. As the court explained:

This Court has recognized for some time that expert testimony prepared solely for purposes of litigation, as opposed to testimony flowing naturally from

an expert's line of scientific research or technical work, should be viewed with some caution.

Id.; see also *Mike's Train House*, 472 F.3d at 408.

A. Mr. Koppe's Methodology for Projecting Emissions Increases Was Prepared Solely for This Litigation.

As explained above, Mr. Koppe's methodology begins with a projection of an increase in unit availability. In his expert report, he identified an approach for projecting the amount of additional availability (measured in terms of equivalent availability factor, or EAF) that he has "found is universal in the utility industry." (Koppe Rpt. 24.) Mr. Koppe did not use this "universal" approach here, however. Instead, as he stated in his expert report, "I was asked to calculate increased EAF in a different way." (*Id.*) As he explained at his deposition:

Q: Who asked you to do it in a different way?

A: I guess it was Mr. Hays.

Q: Okay. And did he say why he want[ed] you to do it in a different way?

A: I don't recall.

Q: But you calculated it the way that Mr. Hays asked you to do it; is that correct?

A: Yes.

(Koppe Dep. 122.)

Thus, Mr. Koppe – without even knowing why – departed from what he described as a "universal" approach at the request of Plaintiffs' lawyer, Mr. Hays. Mr. Koppe's action confirms that he is what the Sixth Circuit has described as "a quintessential expert for hire." *Johnson*, 484 F.3d at 435 (internal quotation marks omitted). That is, his testimony does *not* "flow[] naturally from his own current or prior research (or field of work)." *Id.* Instead, his opinions were "conceived, executed, and invented solely in the context of this litigation." *Id.* (internal quotation marks omitted). And it could hardly be otherwise, because Mr. Koppe does not

perform emission calculations except as a witness in lawsuits, and he does not have any non-litigation work or research that he could be applying here. Instead, his work is essentially to be a full-time witness – he has appeared as a paid witness in at least ten cases during the last several years, and such work is his major source of income. (Koppe Rpt. 1; Koppe Dep. 144-45.)

The fact that an expert’s testimony “has been developed for purposes of the litigation” rather than “growing naturally and directly out of [his] own research” is “a ‘very significant fact to be considered’” in determining the methodology’s reliability. *Mike’s Train House*, 472 F.3d at 408 (quoting *Daubert v. Merrell Dow Pharms., Inc.*, 43 F.3d 1311, 1317 (9th Cir. 1995)). Here, the fact that Mr. Koppe’s methodology was prepared solely for this litigation, based on the instructions of Plaintiffs’ lawyer, weighs strongly against its admissibility.

B. Mr. Koppe’s Methodology for Projecting Emissions Increases Is Neither Published Nor Generally Accepted.

Nothing in Tennessee’s regulations identifies the methodology Mr. Koppe used to project emissions as an appropriate methodology. In fact, Mr. Koppe could identify no Tennessee or Federal regulatory guidance describing or even acknowledging – much less endorsing – the methodology he used here to project an emissions increase:

Q: . . . [T]he methodology that you’ve used in this case, is it described anywhere in TDEC’s regulations?

A: I have not seen it.

Q: Okay. Is the methodology you’ve used in this case described anywhere in any sort of a TDEC document whether it’s written guidance, applicability determination, whatever?

A: I don’t know.

Q: Has anyone from TDEC ever told you that the method you used in this case was an appropriate one to use?

A: No.

Q: Is the . . . methodology that you've used in this case, is it described in any EPA written document or guidance that existed as of 1988?

A: I don't know.

* * *

Q: Is the methodology that you've used in this case described anywhere in the EPA 1980 Prevention of Significant Deterioration Workshop Manual?

A: I don't know.

* * *

Q: . . . Is the methodology that you've used in this case to project emissions increases, has it ever been described in any EPA written documentation no matter when it came out?

A: I don't know.

(Koppe Dep. 131-33.) Outside of EPA or TDEC guidance, Mr. Koppe claims his methodology was published "back into the 70s and 80s," but he could not name any such publications and has not disclosed them in his expert report. (Koppe Dep. 134.)

In short, Mr. Koppe has identified no basis to find that the methodology he used here enjoys general acceptance in any relevant community.

C. Mr. Koppe's Methodology for Projecting Emissions Increases Has Not Been Adequately Validated and Tested.

Mr. Koppe claims that he himself has "tested" his methodology, but (1) any such "testing" has never been published in any journal or book (Koppe Dep. 138-39), and (2) no documentation of any such "testing" has been included in his expert disclosures in this case (*id.* at 136). Such unofficial, undisclosed "tests" do not qualify under *Daubert*, because "[t]he trial court's gatekeeping function requires more than simply 'taking the expert's word for it.'" *Thomas v. City of Chattanooga*, 398 F.3d 426, 432 (6th Cir. 2005) (*quoting* Fed. R. Evid. 702 advisory committee's note). Instead, "*Daubert* and its progeny make clear that '[p]roposed [expert] testimony must be supported by appropriate validation.'" *Pride*, 218 F.3d at 578

(quoting *Daubert*, 509 U.S. at 591). As the Sixth Circuit has held, a “complete failure to test . . . cuts heavily against” admissibility. *Johnson*, 484 F.3d at 433.

Here, the Court should find Mr. Koppe’s methodology to be inadequately validated and tested, and this weighs against its admissibility.

D. Mr. Koppe’s Methodology for Projecting Emissions Increases Results in False Positives, and Has No Standards or Defined Error Rate.

Mr. Koppe identified no standards controlling the technique he used here. Nor could he specify any error rate for his methodology (Koppe Dep. 136-140) other than to suggest at one point that “the error rate is a hundred percent” (i.e., the projections are never expected to be *exactly* right) (*id.* at 139). Further, he admitted that in his experience, his methodology produces false positives. That is, his “methodology has in the past predicted increased emissions and then in reality emissions went down.” (*Id.* at 137.) This is not surprising, because what Mr. Koppe is in fact predicting is not emissions or generation, but rather *availability*. However, as Mr. Koppe himself explained, “[e]ven when a unit is available to generate power, the utility may choose to not run it or run it at less output than it is capable of at the moment” – for example, “at times when the use of electricity by customers is less and when other units are available to generate electricity at lower cost.” (Koppe Rpt. 17.) Thus, as he acknowledged, “increased availability for a coal-fired power plant does not necessarily translate into increased generation from the coal-fired power plant.” (Koppe Dep. 21.)

A good example of the errors and false positives that result from Mr. Koppe’s methodology is demonstrated by the record in this very case. Mr. Koppe’s methodology amounts to simply counting the hours of downtime caused by a tube leak in a particular component, and then projecting that exactly the same amount of downtime will occur in the future if the component is not replaced. Heading into the March 1988 outage, the Bull Run plant

had operated for 15 consecutive months without any forced outages or downtime caused by economizer tube leaks. (Koppe Dep. 65.) However, there had been outages caused by economizer tube leaks in the years prior to 1987 – two in 1986, in fact. Mr. Koppe acknowledges that if he had used his methodology to predict for calendar year 1987 the number of Bull Run outages that would be caused by the economizer, he would have predicted some amount of outages and unavailability caused by the economizer for 1987 based on the outages in prior years. (Koppe Dep. 143.) But this prediction would have been wrong, because Bull Run operated for all of 1987 without even one minute of downtime due to economizer tube leaks.

The facts that Mr. Koppe’s methodology is so capable of falsely projecting availability and emissions increases, together with the lack of any defined error rate or standards for assessing the likelihood of a false positive in any given case, weigh against admissibility.

E. The Invalidity of Mr. Koppe’s Methodology for Projecting Emissions Increases Is Confirmed by the Absurd Results It Produces.

Finally, Mr. Koppe’s methodology produces absurd results – his “test” is triggered so easily that it is essentially no test at all. For SO₂ emissions at Bull Run, Mr. Koppe’s “test” would trigger PSD applicability based on only 8 hours per year of downtime (i.e., 16 total hours over a two year baseline period). (Koppe Dep. 127-28.) But the process of cooling down the Bull Run plant, fixing something that is broken, and starting the plant back up takes longer than that. (*Id.* at 128.) As Mr. Koppe testified:

Q: So under your test, fixing a problem that caused 16 hours of down time triggers an obligation to install a \$300 million scrubber?

A: That’s the way it comes out.

Q: Okay.

A: I didn’t write the regulations.

(*Id.* at 130.)

Although Mr. Koppe blamed “the regulations,” he acknowledges that his methodology is not “described anywhere in TDEC’s regulations.” (*Id.* at 131-32.) Nor is his methodology consistent with TDEC’s views about how its own regulations operate. According to Barry Stephens, the Director of TDEC’s Air Division, Tennessee’s PSD regulations are not intended to be triggered by “replacing deteriorated or broken equipment to keep a source operating as it was intended to operate and as it was permitted to operate.” (Ex. 1, Stephens Decl. ¶ 12.)

Accordingly, the problem is not “the regulations.” Rather, the problem is Mr. Koppe’s methodology. The absurd results it produces – that hundreds of millions of dollars of pollution reduction obligations could be triggered simply by replacing a component that has caused just one short outage over the course of two years, in order to keep a plant running reliably as it was intended and is permitted to operate – confirm that it is an invalid methodology.

CONCLUSION

For the foregoing reasons, TVA respectfully requests the Court to exclude the emissions increase opinion testimony of Plaintiffs’ witness Robert H. Koppe.

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CERTIFICATE OF SERVICE

I hereby certify that on April 11, 2008, a copy of the foregoing was filed electronically. Notice of this filing will be sent by operation of the Court's electronic filing system to all parties indicated on the electronic filing receipt. All other parties will be served by regular U.S. mail. Parties may access this filing through the Court's electronic filing system.

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